SUPREME COURT, U.S.

AUG 7 1968

JOHN F. DAVIS, CLERK

IN THE

Supreme Court of the United States

October Term, 1968

No. 388

MALCO MANUFACTURING COMPANY, a Partnership, AMPHENOL CORPORATION, and MALCO MANUFACTURING COMPANY, INC.,

Petitioners,

vs.

NATIONAL CONNECTOR CORPORATION,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

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Petitioners,

vs.

NATIONAL CONNECTOR CORPORATION,

Respondent.

PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE EIGHTH CIRCUIT

Petitioners, Malco Manufacturing Company, Amphenol Corporation (now Bunker-Ramo Corporation) and Malco Manufacturing Company, Inc., pray that a Writ of Certiorari issue to review the judgment of the United States Court of Appeals for the Eighth Circuit, entered in the above-entitled case on April 11, 1968.

OPINIONS BELOW

The opinion of the United States District Court for the District of Minnesota, Fourth Division, is reported at 151 U.S.P.Q. 255, and is printed in the Appendix, pp. A-1 to A-27. The opinion of the Court of Appeals, reported at 392 F.2d 766, is printed in the Appendix, pp. A-28 to A-38.

JURISDICTION

The judgment of the Court of Appeals was entered April 11, 1968. On June 26, 1968, Mr. Justice White granted until August 9, 1968 within which to petition for certiorari. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

QUESTION PRESENTED FOR REVIEW

Did the Court of Appeals for the Eighth Circuit deviate from the standard of patentable invention set forth by this Court in *Graham*[1] and *Adams*[2] by substituting its own subjective standards of obviousness for the factual findings of the trial court?

CONSTITUTIONAL PROVISION AND STATUTES INVOLVED

The constitutional provision involved is Article I, Section 8, Clause 8.

The statutes involved are 35 U.S.C. § 103 and the first sentence of § 282.

These provisions are set forth in the Appendix, p. A-39.

STATEMENT OF THE CASE

Petitioners seek to revive the patent system in the Eighth Judicial Circuit where the Court of Appeals has, since *Graham* v. *John Deere Co.*[3] and *United States* v. *Adams*,[4] adopted a standard of patentable invention so strict and has so deviated from the standards enunciated

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[1] Graham v. John Deere Co., 383 U.S. 1 (1966).
[2] United States v. Adams, 383 U.S. 39 (1966).
[3] 383 U.S. 1 (1966).
[4] 383 U.S. 39 (1966).

by this Court that every patent coming before that court has been held invalid, thereby precluding the operation of the patent system in 14% of the entire United States.[5]

The Patented Invention[6]

The patent involved in this action,[7] United States Patent No. 2,995,617, covers a joint invention of three inventors, including Alex Just, the deceased founder of the petitioners Malco Manufacturing Co., Inc., and Malco Manufacturing Company. Petitioner Amphenol Corporation (now Bunker-Ramo Corporation) is a joint owner of this basic terminal connector patent.

Since the advent of "modern electronics", such as electronic computers and electronic telecommunications systems, there has been a need for multiple terminal connectors capable of making hundreds, thousands, or even tens-of-thousands of individual electrical connections through a single terminal connector (A-4). Prior to the Just et al invention this need had been inadequately served by a composite of "molded connector blocks", which are subject to a number of inherent deficiencies (A-4, -5).

The Just et al invention made possible the employment of a matrix plate containing vast numbers of closely spaced terminal connectors which are capable of being wired upon automatic wire-wrap machines (A-7). The

---

[5] Arkansas, Iowa, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, including the significant industrial areas of St. Louis, Omaha, Minneapolis and Des Moines.

[6] The factual statements herein are based entirely upon findings of fact made by the district court, which were not set aside on appeal.

[7] Petitioners seek a review of only that portion of the Court of Appeals' decision which constitutes a reversal of the decision of the trial court.

Just et al matrix plate connector is now preferred over the composite molded connector blocks (A-7).

After having heard the testimony of many witnesses in over five weeks of trial, The Honorable Gunnar H. Nordbye found as a fact that the subject matter of the claims of the Just et al patent "was not obvious at the time the invention was made to persons having ordinary skill in the art" (A-8). The Court of Appeals for the Eighth Circuit made no comment on this finding, but instead substituted its own opinion that while the invention was "a good idea" it was not sustainable (A-37).

The district court also found that the Just et al invention "has filled a long-felt want" and terminal connectors embodying this invention "have found wide use and commercial success in industry" (A-8), and that there has been "phenomenal acceptance" of the Just et al invention by private industry and the government, for example, in the Polaris missile program (A-23, -24).

Infingement by Respondent

The trial court found that respondent's terminal connectors infringed "the heart of" the Just et al invention (A-10).

REASONS FOR GRANTING THE WRIT

I. The Court of Appeals for the Eighth Circuit has become the "patent graveyard" of the United States. Since *Graham* and *Adams* it has ruled every patent coming before it to be invalid while the courts of appeals of other circuits have ruled about 40% of litigated patents valid. This Court should grant certiorari to establish a uniform application of the statutory standard of patentable invention.

In February, 1966 this Court, in *Graham* v. *John Deere*

Co.[8] and *United States* v. *Adams*,[9] considered the conditions of patentability of inventions and specifically focused attention upon the requirement of "nonobviousness" imposed by Section 103 of Title 35. The guidance afforded by these cases has not been felt in the Eighth Judicial Circuit.

A comparison of the record of the Court of Appeals for the Eighth Circuit in patent infringement cases with the records of the courts of appeals for other circuits since *Graham* and *Adams* reveals a striking contrast.[10]

Since these decisions, the Court of Appeals for the Eighth Circuit has considered the validity under Section 103 of 14 patents in 12 patent infringement cases. It has held *each* of these patents invalid on the ground that the alleged invention was obvious. During the same period, the courts of appeals for the other judicial circuits, in a total of 95 patent infringement cases, have ruled on the validity under Section 103 of 109 patents and ruled 41 (or 38%) to be valid.

Thus while the Court of Appeals for the Eighth Circuit could not find a single nonobvious invention, the courts of appeals for the other judicial circuits found, on the average, that at least one out of every three patents was valid and disclosed a nonobvious invention.

The complete statistics for patent infringement cases decided under Section 103 are as follows:[11]

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[8] 383 U.S. 1 (1966).

[9] 383 U.S. 39 (1966).

[10] The statistics hereinafter are based on all patent infringement cases decided since *Graham* and *Adams* and reported in Volumes 148 through 158 (Nos. 1-4), United States Patents Quarterly, which considered the obviousness or nonobviousness of the invention under Section 103.

[11] The Courts of Appeals for the First, Tenth and District of Columbia Circuits have had only one patent infringement case each, insufficient to be a meaningful representation of the attitudes

Circuit	Cases	Patents Ruled On	Held Valid	Held Invalid	% Held Valid
SECOND	11	12	3	9	25%
THIRD	7	8	4	4	50%
FOURTH	5	5	1	5	20%
FIFTH	10	12	4	8	33%
SIXTH	5	5	4	1	80%
SEVENTH	34	39	21	18	54%
EIGHTH	**12**	**14**	**0**	**14**	**0%**
NINTH	20	25	3	22	12%

Also significant is the fact that about 40% of the patents coming before the Eighth Circuit Court had been held *valid* below. Each of these decisions was reversed. However, none of the decisions where the lower court found the patent *invalid* were reversed.

By contrast, in all but one other judicial circuit, the lower court was affirmed at least 50% of the time when it held the patent valid. Even the exception, the Ninth Circuit, affirmed one out of every three decisions in which the lower court held a patent valid.

The complete statistics are as follows:[12]

Circuit	Patents Held Valid by Lower Court	Valid Patents Sustained on Appeal	% Valid Patents Sustained on Appeal
SECOND	3	2	67%
THIRD	2	1	50%
FOURTH	1	1	100%
FIFTH	6	4	67%
SIXTH	4	4	100%
SEVENTH	20	18	90%
EIGHTH	**5**	**0**	**0%**
NINTH	9	3	33%

of these judicial circuits. Accordingly, they are omitted from this tabular listing, though included in the figures of the "other judicial circuits" discussed above. The Court of Appeals for the District of Columbia held the litigated patent valid while the First and Tenth Circuits held the patents invalid.

[12] The Courts of Appeals for the First, Tenth and District of Columbia Circuits affirmed the lower court in each instance.

There is no reason to believe that the patents involved in the suits brought in the Eighth Circuit were any stronger or any weaker, on the average, than those involved in suits brought in other circuits. Nor is there any reason to believe that the lower courts of the Eighth Circuit are less competent to properly apply the standard of Section 103 than the lower courts of the other circuits. The foregoing statistics, therefore, appear to admit of no other conclusion than that the Court of Appeals for the Eighth Circuit, since this Court's reversal of *Calmar, Inc.* v. *Cook Chem. Co.*,[13] applies a much harsher standard of nonobviousness under Section 103 than the appellate courts in the other circuits—a standard so unattainable that, as a practical matter, the patent system has ceased to exist in the Eighth Circuit.

This disparity is common knowledge among practicing patent attorneys and there is no basis for expectation that this inequitable situation will be cured other than by review by this Court.

II. The Court of Appeals erred in ruling the Just et al patent invalid on the basis of subjective appraisal of what was obvious and in requiring the patentee to prove difficulty or deterrence in taking the steps toward the invention, where the trial court expressly found that the invention was not taught or suggested by the prior art, was not obvious to persons having ordinary skill in the art, achieved important results and had such secondary indicia of nonobviousness as commercial success and satisfaction of long-felt want.

After twenty-four days of trial, 4,000 pages of testimony, and lengthy post-trial briefs, The Honorable Gunnar A.

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[13] A case decided by the Eighth Circuit, 336 F.2d 110 (1964), and reversed by this Court in the *Graham* decision, 383 U.S. at 26 (1966).

Nordbye rendered a written memorandum decision with extensive findings of fact and conclusions of law (A-1 to A-28). Specifically the district court found that:

> Prior to the Just et al invention the need for multiple terminal connectors was met by molded connector block composites, which are subject to a number of inherent deficiencies (A-4, -5);
>
> The Just et al terminal connector eliminates the deficiencies of the composite molded block connectors (A-5, -6), has many important advantages (A-5 to A-7) and is preferred over the molded block composites (A-7);
>
> The prior art relied upon by the respondent did not constitute an anticipation of the Just et al invention, lacked one or more of the features of the invention and did not show or suggest the invention (A-8, -23, -24);
>
> The Just et al invention "was not obvious at the time the invention was made to persons having ordinary skill in the art to which said subject matter pertains" (A-8); and
>
> The Just et al invention "filled a long-felt want" and has "found wide use and commercial success in industry" (A-8, -23, -24).

These findings clearly demonstrate the trial court's meticulous adherence to the basic factual inquiries which are called for by this Court in *Graham* in determining the question of obviousness or nonobviousness:

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances sur-

> rounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevancy.[14]

These findings of fact were *not* set aside by the Court of Appeals for the Eighth Circuit. Conjecturing that Just et al were merely "first with a good idea," the court applied hindsight to strike down the patent, while at the same time purporting to condemn the use of hindsight "to deny patentability in every case" (A-36, -37).

By contrast the Court of Appeals for the Eighth Circuit has granted considerable weight to findings by the lower court where a patent has been held invalid below. In affirming the lower court's findings of invalidity, this Court of Appeals said in *Greening Nursery Co.* v. *J & R Tool & Mfg. Co.*:[15]

> Rule 52(a), F.R.C.P., provides "Findings of fact shall not be set aside unless clearly erroneous, * * *" and "[t]his Court has traditionally given considerable weight to a District Court's determination that a particular modification of prior art is one which might have been developed by a mechanic in the art, even though the ultimate issue of 'obviousness' must be considered a matter of law." . . . Piel Manufacturing Co. et al. v. George A. Rolfes Co. et al., 363 F. 2d 57, 150 U.S.P.Q. 330 (8th Cir. 1966). The Court's conclusion in that case that: "[t]here is nothing in facts presented here to lead us to a different result" applies equally well in the case at bar.

Also exemplary is *Automated Bldg. Components, Inc.* v. *Hydro-Air Eng'r., Inc.*,[16] wherein the Eighth Circuit said:

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[14] Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966).

[15] ____ F.2d ____, ____, 153 U.S.P.Q. 660, 663 (8th Cir. 1967).

[16] 362 F.2d 989, 991 (8th Cir. 1966).

> From a careful reading of the entire record we agree with Judge Regan's conclusion. His opinion, not being clearly erroneous, is conclusive on appeal. Steffan v. Weber Heating & Sheet Metal Co., 8 Cir., 1956, 237 F. 2d 601, 602; Trico Products Corp. v. Delman Corp., 8 Cir., 1950, 180 F. 2d 529, 530. Though drafted before *Graham* and *Adams*, the opinion clearly follows the dictates of § 103, as interpreted by the Supreme Court, in discussing a proper standard of invention.[17]

Yet in none of the cases where the patent was sustained by the lower court did this Court of Appeals give any weight to the findings and affirm the validity of the patent.[18]

Thus this Court of Appeals grants to the infringer—the noncreative follower in the industry—the benefit of the findings of the lower court where the patent has been held invalid, but denies the patentee—the forward-thinking leader in the field—the benefit of the findings of the lower court where the patent is held valid.

Such discriminatory application of Federal Rule 52 is one reason why the Eighth Circuit Court, since *Graham* and *Adams*, has yet to hold a patent valid.

Furthermore, this Court of Appeals has placed an additional unrealistic legal hurdle before a patentee. It has erroneously read into *Graham* and *Adams* a positive

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[17] See also Gerner v. Moog Indus., Inc., ___ F.2d ___, ___, 155 U.S.P.Q. 232, 234 (8th Cir. 1967); Imperial Stone Cutters, Inc. v. Schwartz, 370 F.2d 425, 428 (8th Cir. 1966).

[18] General Mills, Inc. v. Pillsbury Co., ____ F.2d ____, 1954 U.S.P.Q. 207 (8th Cir. 1967); L & A Britt Prods., Inc. v. Britt Tech Corp., 365 F.2d 83 (8th Cir. 1966); American Infra-Red Radiant Co. v. Lambert Indus., Inc., 360 F.2d 977 (8th Cir. 1966); Kell-Dot Indus., Inc. v. Graves, 361 F.2d 25 (8th Cir. 1966).

requirement that an invention must constitute taking steps which were "inherently difficult or deterred" by the prior art. This is evident in the court's opinion in this case:

> Malco fails to point out any prior difficulties or deterrent known with electrical connectors involving the combination of "the square peg in a round hole." C.f. *United States* v. *Adams*, supra. [A-35]
>
> • • •
>
> However, at the same time, to deny patentability where the combination of elements is an obvious step, *where no inherent difficulties or deterrents are involved in making the step,* where the new combination results in a natural phenomenon, even though all of the advantages were not foreseen, should not bring into play the introspective condemnation of using "hindsight." [A-37. Emphasis added.]

Although this Court of Appeals conceded that Just et al were "first with a good idea" (A-37), it dismissed the heart of the invention with the superficial statement "nor are we impressed with the *nuance* urged that pressure interference fit takes place within the board rather than without" (A-35. Emphasis added.). If the Court of Appeals had understood and honored the findings of the lower court this "nuance" and others would have spelled nonobviousness and true invention.

CONCLUSION

It is urgently necessary that this Court grant certiorari if the patent laws of the United States are to have meaning within the Eighth Judicial Circuit. Though the Court of Appeals for the Eighth Circuit gives lip service to the standards enunciated by this Court in *Graham* and *Adams*, its record reveals that it does not abide by these standards.

The present case is a dramatic example of the prohibitive standard of patentable invention applied in the Eighth Circuit. The Just et al invention should take its proper place in the electrical connector industry as a basic invention which may be enforced through our patent system against infringers. Instead, the Just et al patent has become another in the long string of patents struck down by the Eighth Circuit. Without the aid of this Court, there is no end in sight.

It is solicited that petitioners' writ be granted to permit this Court to review and correct the erroneous and ill-founded judgment of the Eighth Circuit Court of Appeals and to revive the patent system in that circuit.

Respectfully submitted,

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APPENDIX

APPENDIX

OPINION OF THE DISTRICT COURT

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA
FOURTH DIVISION

4-61 Civ. 243

MALCO MANUFACTURING COMPANY, a partnership, and

AMPHENOL-BORG ELECTRONICS CORPORATION, and

MALCO MANUFACTURING COMPANY, INC., a corporation,

Plaintiffs,

vs.

NATIONAL CONNECTOR CORPORATION,

Defendant.

FINDINGS OF FACT, CONCLUSIONS OF LAW and ORDER FOR JUDGMENT

Appearances:

Mr. William Marshall Lee and Mr. Roy E. Hofer, Chicago, Illinois (Messrs. Hume, Groen, Clement & Hume, Chicago, Illinois, of counsel) and Mr. H. Dale Palmatier, Minneapolis, Minnesota, for Malco Manufacturing Company and Malco Manufacturing Company, Inc.;

Mr. Erwin C. Heininger and Mr. Jack Guthman, of Messrs. Mayer, Friedlich, Spiess, Tierney, Brown & Platt, Chicago, Illinois (Mr. Lowell F. Hammond, Broadview, Illinois, of counsel) for plaintiff Amphenol-Borg Electronics Corporation;

Mr. John D. Gould and Mr. Robert T. Edell, of Messrs. Merchant, Merchant & Gould, Minneapolis, Minnesota, for defendant.

This cause having come to be heard and the evidence of the parties having been duly received, the parties having filed their respective briefs in the cause, and this Court having fully considered the premises, the following Findings of Fact and Conclusions of Law are hereby entered:

FINDINGS OF FACT

1. Plaintiff Malco Macturing Company is a partnership comprising Margaret R. Just, the wife of Alex Just, and Rosemary Winters and Lynne Carole Stoneberg, Mr. Just's married daughters, all of whom are residents of the County of Cook, State of Illinois, hereinafter sometimes referred to as "Malco partnership". Mr. Alex Just, at all relevant times up to his death in April, 1963, was a member of and the operating head of the Malco partnership.

2. Plaintiff Malco Manufacturing Company, Inc., is an Illinois corporation having its principal place of business at 4025 West Lake Street, Chicago, Illinois, hereinafter sometimes referred to as "Malco corporation". It was formed in April, 1963, and became the operating company taking over most of the functions of the Malco partnership.

3. Plaintiff Amphenol Corporation, formerly Amphenol-Borg Electronics Corporation, is a Delaware corporation having its principal office at 2801 South 25th Avenue, Broadview, Illinois, hereinafter sometimes referred to as "Amphenol".

4. Defendant National Connector Corporation is a Minnesota corporation having a regular and established place of business in Minneapolis, Minnesota.

5. By their complaint, plaintiffs charge the defendant with infringement of the following United States Letters Patents:

Patent No.	Patentees	Issue Date
2,995,617	Alex Just, et al.	August 8, 1961
3,086,074	Alex Just, et al.	April 16, 1963
3,136,591	Alex Just, et al.	June 9, 1964

Plaintiffs seeks an accounting for past damages, an injunction against future infringement, costs and other relief.

6. Defendant, by its answer, denies that the three patents in suit are valid and infringed and alleges patent misuse. Defendant also counterclaims for declaratory judgment declaring the three patents in suit to be invalid and not infringed.

7. Defendant also counterclaims charging the plaintiffs with violations of the antitrust laws of the United States and seeks an accounting for damages. Plaintiffs, by their answer, deny any patent misuse or antitrust law violation.

8. The accused terminal connectors and terminal connector assemblies of the defendant are of six types, referred to hereinafter as Type A (PX 57 Series), Type B (PX 59 Series), Type C (PX 60 Series), Type D (PX 64 Series), Type E (PX 65 Series) and Type F (PX 66 Series). Each of these terminal connectors and terminal connector assemblies have been manufactured, sold and/or offered for sale within the District of Minnesota and elsewhere in the United States of America and the defendant National Connector Corporation continues to manufacture, sell and/or offer for sale these terminal connectors and terminal connector assemblies. Defendant National Connector Corporation has sold Type A, B, C, D, E and F terminal connectors and terminal connector assemblies for

non-governmental uses since the issue date of the patent or patents that each are alleged to infringe. Type A through F terminal connectors and terminal connector assemblies have been offered for sale to the electronics industry in general without restriction as to governmental or non-governmental uses.

9. The Court has jurisdiction over the parties and the subject matter. The issues presented are the validity and infringement of the three patents in suit and the questions presented under defendant's antitrust counterclaim and patent misuse.

10. In the middle of the late 1940's Alex Just founded Malco in Chicago, Illinois. Malco began as a sole proprietorship, but subsequently was converted to the Malco partnership and then into a corporation. Until the development of the inventions covered by the patents in suit, Malco's business was primarily with terminals for the radio, television and telephone industry.

Since the advent of "modern electronics," e.g., electronic computers, electronic telecommunications systems, there has been a long-felt need for multiple terminal connectors capable of making hundreds, thousands, and even tens-of-thousands of individual electrical connections through a single terminal connector. Prior to the inventions of the patents in suit this need had to be met with a composite of "molded connector blocks". Molded connector blocks comprise a plurality of terminals held in spaced relation in a molded plastic block. A plurality of these molded connector blocks held in side-by-side relation by a frame member form a composite of molded connector blocks.

11. Molded connector block composites have been used for many years and are still used by some large electronic companies which have spent millions of dollars in manu-

facturing and tooling equipment. The molded connector block composites are subject to a number of inherent deficiencies. It is not possible to obtain extreme accuracy of placement of individual terminals in a single connector block because of the shrinkage problem which occurs during molding. The problem is multiplied in the composite because of the inaccuracies introduced due to tolerance accumulations when the molded blocks are individually secured to the large panel or frame. The individual blocks are also subject to displacement with respect to the other blocks in the frame and provide no flexibility for circuit change since, once the block is molded, it is fixed and terminals which are molded in place must stay there, while others which may be necessary in the future cannot be added in any commercially practical manner. The rack with the molded blocks attached is heavy and subject to warpage. Since the molded blocks themselves are of insulating material they cannot be used as an electrical grounding plane for the entire connector. The blocks themselves are relatively fragile and subject to breaking and chipping.

12. The first patent in suit, United States Patent No. 2,995,617, relates to a self-locking terminal connector comprising a metallic baseboard, a somewhat softer terminal sleeve, and a metallic terminal pin. The terminal pin has an integral connector portion, generally at each end, for connecting to an electrical lead. The pin is mounted in a passage in the sleeve and the sleeve is locked in a receiving aperture in the baseboard through an opposed pressure interference fit.

More specifically, between its connector ends the metallic terminal pin has a gripping shank with a non-round cross-section and a maximum transverse dimension larger than the passage in the sleeve. Preferably, the gripping shank

has a rectangular cross-section, the maximum transverse dimension being the width of the gripping shank. When the terminal pin is inserted in the passage in the sleeve, which has been placed in the aperture in the baseboard, the maximum transverse dimension of the gripping shank has a substantial interference fit in the sleeve passage and tends to expand the sleeve within the baseboard aperture. The opposed interference fit between the terminal pin and sleeve causes the sleeve to firmly grip the board at two opposite sides. The terminal pin is firmly held in the sleeve and the sleeve firmly held in the baseboard. The self-locking terminal connectors of the first patent in suit have many advantages, particularly for precision high density application in complex electronic devices such as computers.

13. A fundamental requirement of non-floating connectors is positive resistance to displacement forces encountered in handling, shipping, wire-wrapping, connection and disconnection and environmental shock-loading. Terminal pins of self-locking terminal connectors of plaintiff's patent No. 1 are rigidly held with respect to their sleeves and baseboards such that they successfully resist all such displacement forces. The terminal pin is resistant to twisting or torque force which could occur, for example, in wire-wrapping operations or environmental shock-loading. The terminal pins also resist forces which tend to tilt them from their perpendicular relation to the baseboard, such as might occur in wire-wrapping or handling. The terminal pin and sleeve are held in the baseboard in a manner that they cannot easily be pushed out of the baseboard, commonly referred to as push-out resistance. Though the self-locking terminal connector has high torque resistance and high push-out resistance, relatively small force is required to insert the terminal pin in the sleeve when as-

sembling the terminal connector in the baseboard. This force is commonly referred to as the "insertion force." Low insertion forces are vital for practical manufacture.

14. Plaintiff's self-locking terminal connector made possible for the first time the employment of a matrix plate containing large numbers of closely spaced terminal connectors capable of being wired upon the automatic wire-wrap machine of the Gardner-Denver Company. The matrix plate connector is preferred over the molded block type of panel connector, which was the only other available connector which may be automatically wire-wrapped when the patent application herein was filed.

15. Claims 1, 2, 3, 5, 6, 7 and 9 of the first patent are in issue, Claims 1 and 5 being the only independent claims. The specification of the first patent in suit contains a description of the invention adequate to enable it to be practiced by those skilled in the art of electrical terminal connectors. The claims of the first patent in suit are amply supported by the specification of this patent, but they are narrower than the disclosure of the application as originally filed and which remained when the patent was granted. Claims 1, 2, 3, 5, 6, 7 and 9 do not define subject matter which was in public use or on sale in this country more than one year prior to the effective filing date of the first patent in suit.

16. Claim 1 is representative of the independent claims of the first patent in suit and reads as follows:

> "A terminal connector for securing in an aperture of predetermined size in a terminal baseboard comprising a terminal sleeve having a passage therethrough and having normal transverse outside dimensions approximately the same as the normal transverse dimensions of said baseboard aperture, a metallic terminal pin having a gripping shank with a maximum

transverse dimension having a substantial interference fit in the transverse dimension of said passage, said gripping shank having a minimum transverse dimension substantially smaller than the transverse dimension of said passage, whereby the outside dimension of the sleeve in the direction of the maximum transverse dimension of the pin is expanded to firmly grip the portion of said terminal board defining said board aperture when said sleeve is inserted in said aperture and said pin is inserted in said sleeve."

17. During the prosecution of the first patent in suit some of the application claims were directed to the locking notches in the gripping shank. The Examiner rejected these application claims inasmuch as locking notches were shown to be old by the prior art. Applicants acquiesced in the Examiner's rejection of these claims and cancelled them so that none of the claims in the first patent in suit are directed to locking notches.

18. The prior art relied upon by the defendant does not contain anything constituting a complete anticipation of Claims 1, 2, 3, 5, 6, 7 or 9 of the first patent in suit. Every terminal connector taught by the prior art lacks one or more of the features required by each of these claims. Nothing in the prior art cited against the first patent in suit shows or suggests the terminal connector defined by Claims, 1, 2, 3, 5, 6, 7 or 9 of that patent. The subject matter of these claims is novel and involves invention over the prior art. The subject matter defined by the claims of the first patent in suit has filled a long-felt want and terminal connectors embodying such subject matter have found wide use and commercial success in industry.

19. The subject matter of Claims 1, 2, 3, 5, 6, 7 and 9 of the first patent was not obvious at the time the invention was made to persons having ordinary skill in the art to which said subject matter pertains.

20. Defendant's Type A terminal connector is charged to infringe Claims 1, 2, 3, 5, 6, 7 and 9 of the first patent in suit and responds fully and in every respect to all requirements of each of said claims, and infringes each of said claims.

21. Defendant's Type A terminal connector has a terminal sleeve having normal transverse outside dimensions which are approximately the same as the normal transverse dimensions of the baseboard aperture. The terminal pin has a gripping shank with a maximum transverse dimension having a substantial interference fit in the transverse dimension of the passage in the sleeve.

22. Defendant's Type B terminal connectors are a crimp terminal connector and a solder terminal connector. The Type B crimp terminal connector and the Type B solder terminal connector have terminal sleeves with normal transverse outside dimensions which are approximately the same as the normal transverse dimensions of the baseboard apertures. The terminal pins have a gripping shank with a maximum transverse dimension having a substantial interference fit in the transverse dimension of the passages in the sleeves. Each of these terminal connectors infringe Claims 1, 2, 3, 5, 6, 7 and 9 of the first patent in suit.

23. None of the metallic terminal pins utilized in defendant's Type A and B terminal connectors utilize locking notches, and hence do not have a minimum transverse dimension in the gripping shank which is in the form of locking notches. But although the Court finds that the term "minimum transverse dimension of the gripping shank" as used in the claims of Patent No. 2,995,617 refer to the area of the locking notches rather than to the thickness of the pin, that is, to identify a non-round pin, as

plaintiffs contend, the patent does not make any claim of novelty in the locking notches, which element was expressly omitted from the claims at the request of the Patent Examiner when the patent was being processed through the Patent Office. It is the utilization in defendant's Types A and B of a "terminal connector for securing in an aperture of predetermined size in a terminal baseboard comprising a terminal sleeve having a passage therethrough and having normal transverse outside dimensions approximately the same as the normal transverse dimensions of said baseboard aperture, a metallic terminal pin having a gripping shank with a maximum transverse dimension having a substantial interference fit in the transverse dimension of said passage * * * whereby the outside dimension of the sleeve in the direction of the maximum transverse dimension of the pin is expanded to firmly grip the portion of said terminal board defining said board aperture when said sleeve is inserted in said aperture and said pin is inserted in said sleeve" which is the heart of plaintiff's novelty in patent No. 2,995,617, and which defendant in its Types A and B series infringes. As reflected in Figures 3, 9, 10, 11, 12, 13 and 14 of the patent drawings, the locking notches are illustrated as part of the gripping shank. These figures and a reading of the specifications would indicate that the locking notches are necessarily embraced in the portion of the claim reading "said gripping shank having a minimum transverse dimension substantially smaller than the transverse dimension of said passage." However, Figures 21, 23 and 24 of the patent drawings do not reflect that the locking notches are the seat of the minimum transverse dimension in the gripping shank. Rather, in these figures the gripping shank has a maximum and a minimum transverse dimension which does not include the so-called locking notches. The seeming confusion

apparently arises because the original patent specifications included the locking notches as part of the patent novelty of the self-locking terminal, and when the novelty of the locking notches claims was omitted at the Patent Examiner's request, the specifications were not modified accordingly.

24. Notwithstanding the depicting of locking notches in the gripping shank in some of the patent drawings, no patent was issued thereon, by reason of the abandonment by the inventors of this alleged phase of the original patent claims, any reference thereto in the specifications or otherwise has necessarily been released to the public. It may be noted that plaintiffs' commercial product of the self-locking terminals, which were on the market before Patent 2,995,617 was issued, contained no so-called locking notches in the gripping shank of the self-locking terminals. By eliminating locking notches and adopting the other main features of plaintiffs' patent, defendant cannot absolve itself from infringement.

25. Defendant's Type C female terminal connector does not utilize a terminal sleeve "having normal transverse outside dimensions approximately the same as the normal transverse dimensions of said baseboard aperture" as required by all of the claims of United States Patent 2,995,617. The gripping shank of the terminal pin of defendant's Type C female connector does not have "a substantial interference fit in the transverse dimension of said passage" as required by all of the claims of U. S. Patent 2,995,617. Defendant's Type C female terminal connector is not the equivalent of the details recited in the claims of U. S. Patent 2,995,617, and plaintiffs are not entitled to a broadening of the claims of this patent under the "doctrine of equivalents" to include defendant's Type C female terminal connector within these claims.

Patent No. 2—No. 3,086,074

1. The second patent in suit, Just, et al., 3,086,074, is entitled "Self-Orientating Terminal Connectors" and allegedly relates to the utilization of square or polygonal-shaped heads on the insulating sleeves to insure proper alignment of the electrical terminal so as to achieve a proper mating between the female connector and a male connector which is plugged into the female. Connectors of the type involved in suit may be either a female connector or a male connector, and the male and female connectors plug together to form what is known as a mated pair. As shown in U. S. Patent 3,086,074, the terminal pin of the female connector is formed from a stamping and comprises a pair of female tines which are adapted to receive a flat male blade. In the ideal situation, the plane of the male blade portion of the male connector will be at a 90° relationship with respect to the plane of the female tines of the female connector. While the perfect 90° relationship between the male and female terminals is the ideal situation, it is not absolutely necessary that this relationship be maintained and a small deviation, or angular misorientation, is permitted. United States Patent 3,086,074 pertains to the utilization of square heads on the insulating bushings; and to the spacing of adjacent square-headed bushings so that if the square-headed bushings are rotated until they contact adjacent bushings, the electrical terminals will still be within the permitted angular misorientation, and a proper mating between male and female connectors can be achieved. United States Patent 3,086,074 refers to this permitted angular misorientation as "the predetermined tolerance of angular orientation".

2. The prior art, Netherlands patent 64,131 and Powell 2,930,020, discloses terminal boards with a plurality of

apertures therethrough and into each of which there is mounted a terminal connector comprising a metal contact and an insulating sleeve with an enlarged collar in the form of a regular polygon. The tubular base portion of the insulating sleeve is mounted in an aperture of the sleeve and completely fills the aperture. Although this prior art discloses polygonal heads which touch each other, it would be quite obvious to anyone with ordinary skill in the art, that in terminal boards utilizing hundreds and even thousands of connector sleeves, and in view of tolerance variations, a small space therefore between the polygonal heads would be advisable, and if it was the inventor's concept of novelty in Patent 3,086,074 that the terminal spacing is determined by the aperture spacing, while the aligning head portions maintain the predetermined angular orientation, and therefore Powell did not anticipate invention of the second patent, it seems reasonable that Netherlands 64,131 did anticipate the alleged novelty in Patent No. 2. The fact that Netherlands teaches that the polygonal-shaped insulators should abut does not negative its importance as prior art. The purpose was that after the bushings had been mounted in the proper position, they then could not be rotated unintentionally.

3. In view of the tremendous growth of the electrical and electronics industry in the early 1960's when it became necessary to have many thousands of terminal connectors assembled in a single plate, it was quite obvious that with this confined space and the close proximity of the polygonal heads it was inevitable that the spacing of the apertures in the terminal plates had to be so designed that the polygonal head portions of the sleeves should be so spaced that there would not be a movement thereof which would be so great that it would permit mismating of the male and female connectors. But merely because the polygonal heads

do not touch one another in a terminal assembly, does not establish that the assembly was arranged by a predetermined tolerance of angular orientation of the terminal connectors or that the touching of the heads comes within the predetermined angular orientation. The variations in the so-called "predetermined tolerance of angular orientation" are so pronounced that that expression becomes vague and indefinite.

4. The evidence herein is convincing that there is no exact predetermined angle at which mismating will occur, and moreover, any movement of the adjacent square-headed bushings in a terminal board is usually minimal. This seems quite evident not only from the physical evidence in court, but in applying for Patent 2,995,617 the patentees, two of whom were the patentees in the second patent, claimed that the bushings were held so firmly in their apertures that the shanks of the terminal pins would twist before the pins would move in the bushings or the bushings would move in the board.

5. The Court finds, therefore, as to the second patent that it discloses no novelty over the prior art other than the utilization of mechanical skill in the spacing of a multitude of apertures in a terminal board requiring a compactness of bushings and terminal pins in a small area and the recognition of the necessity of some spacing between the polygonal bushings in view of the necessity of replacing damaged bushings. The showing herein is that if a bushing is rotated at a certain number of degrees so that it touches the adjacent bushing or bushings, that fact does not establish that they are spaced by any predetermined tolerance of angular orientation so as to prevent mismating of the male and female connectors.

6. In utilizing the mechanical skill necessary to align

the apertures in terminal boards which were to receive the bushings and the connectors in the electrical and electronics industry, it was obvious that in spacing the apertures in the terminal board, the space between them could not be so great that the inserted bushings and the terminals therein could be moved or turned to the number of degrees which would permit mismating of the terminals.

7. It is urged that included in the novelty of the second patent in suit is the idea that in providing a spacing of the heads of the terminal sleeves from one another and when manufacturing tolerances are considered, the sleeves will not interfere with one another to the extent that there will be a bulging or bowing of the base plate, but it seems obvious that if this is a result of the assembled arrangement which the plaintiffs have devised in Patent No. 2, it was a mere exercise of mechanical skill in assembly and not invention.

8. The Court finds that Claims 1, 2, 3 and 4 of the second patent in suit are invalid and plaintiffs have not sustained the burden of proof in establishing that defendant's Types A, B, C, D and F infringe.

Third Patent—No. 3,136,591

1. United States Patent 3,136,591, the third patent in suit, relates to a terminal connector, or header, which is mounted to a vertically extending printed circuit board. The header portion of the printed circuit board assembly comprises a plate having a plurality of holes therethrough, and in each of which is mounted an insulating sleeve. A metal contact extends through a central aperture in each of the insulating sleeves, with the upper portion of each of the metal contacts bent at a 90 degree angle. The 90 degree portions of the metal contacts extend through apertures in

a vertically extending printed circuit board and are soldered or otherwise suitably mounted thereto in contact with the circuitry on the printed circuit board.

2. Claim 1 of the third patent, the only independent claim, reads as follows:

> "A terminal connector assembly, comprising a metallic base plate, a printed circuit board mounted on said base plate and extending substantially perpendicular thereto, said circuit board having electrical circuitry thereon, a plurality of apertures formed in said metallic base plate and disposed in at least one row generally parallel to said circuit board, a terminal connector mounted in each of said apertures, each of said terminal connectors including a metallic terminal pin extending through a sleeve formed of relatively soft insulating material and seated in a corresponding aperture, each of said pins having one portion at one end extending generally parallel to said base plate and forming an electrical connection with said circuitry, and another portion at the opposite end for electrical connection into electrical means of which the printed circuitry forms a component."

3. Plaintiffs charge contributing infringement as to the third patent in that the defendant does not manufacture the printed circuit board, but its assembly is made for a circuit board substantially as set forth in Claim 1 of the patent. Types C and D of defendant's terminal connector assembly are charged to infringe Claims 1 and 2 of the third patent. Type E of defendant's terminal connector assembly is charged to infringe Claim No. 1.

4. Defendant's Type C, the male header, and Types D and E, terminal connectors, are sold by the defendant with the knowledge that printed circuit boards are to be attached to the terminal connector assembly. None of defendant's printed circuit boards would ultimately be mounted on the

base plate as the patent requires. However, this variance would not absolve the defendant from infringement if Patent No. 3 is valid. The evidence fully establishes a finding, and the Court does find, that defendant's contributing structures achieve the same result as taught by Claims 1 and 2 of Patent No. 3 and in substantially the same manner.

5. The purpose of Patent No. 3 is to provide a high concentration of terminals, but the use of circuit boards was old in the art and the evidence fully justifies a finding, and the Court does find, that the only difference between U. S. Patent 3,136,591, the third patent in suit, and U. S. Patent 3,086,074, the second patent in suit, is that the terminals in the third patent are bent at 90 degrees for connection to a vertically extending circuit board. These two patents were co-pending, but the second patent was filed February 13, 1961, and issued April 16, 1963. The third patent was filed February 12, 1962, and issued June 9, 1964. The bending of the tips of the pin at this angle for connection to a vertically extending printed board was known in the prior art in molded printed circuit board headers, and therefore in the rapidly advancing technique in the manufacture of the high concentration of terminals the bending of the pins at 90 degrees in a terminal connector assembly for a connection to a vertically extending circuit board would seem quite obvious to one with ordinary skill in the art.

6. The Court finds, therefore, that Patent 3,136,591 is invalid by reason of the known prior art and that the alleged novelty therein would be obvious to one with ordinary skill in the art.

7. The defendant contends that Patent No. 3 is invalid since the alleged invention was in public use or on sale in this country more than one year before the date of the application for the patent contrary to the requirements of

35 U.S.C. 102(b). This defense is based upon alleged sales to Control Data Corporation on January 18, 1961, but the evidence fairly establishes that this purchase order was for experimental purposes only and that the experiments with respect thereto were not completed until a date less than a year before the patent application was filed on February 12, 1962. The evidence does not sustain the contention of the defendant that a sale in violation of 35 U.S.C. 102(b) was made to National Cash Register of a printed board header more than a year prior to the filing date of Patent No. 3. Hence the Court finds that Claims 1 and 2 of Patent No. 3 do not define subject matter which was in public use or on sale in this country more than one year prior to the effective filing date of said patent.

8. Although the Court finds that Claims 1 and 2 of U. S. Patent 3,136,591 are invalid, as heretofore stated, it finds that if they are valid, defendant by using and selling the Type C, D and E series contributed to the infringement of said claims and would be, in view of the evidence, a contributory infringer.

Counterclaim of Defendant and Charge of Patent Misuse

1. The defendant, as an additional defense to the charge of infringement of the patents in suit, contends that plaintiffs have engaged in patent misuse and have violated the antitrust laws.

2. On July 1, 1961, Malco and Amphenol-Borg Electronics Corporation entered into an agreement whereby Malco granted Amphenol a fifty per cent interest in various patents, including Patent 2,995,617 and Patent 3,086,074. A fifty per cent interest in the third patent, 3,136,591, was assigned to Amphenol on June 9, 1964.

3. On July 1, 1961, an agreement was entered into between these parties wherein it was agreed that neither party could grant any licenses under the patents above referred to without the written consent of the other, and a supplemental agreement between the parties provided for joint prosecution of patent infringement claims.

4. On July 20, 1961, another agreement was entered into between Malco and Amphenol whereby Malco granted Amphenol the option to purchase an undivided fifty per cent interest in any future patent application which Malco may file on self-locking terminal devices and Amphenol made a reciprocal agreement to the same effect with Malco.

5. Mandex Manufacturing Company is an Illinois corporation which was closely related to the Malco partnership through family ownership by Mr. and Mrs. Alex Just, the latter being the owners of the stock of Mandex, the corporation, and were the principal partners in Malco, the partnership.

6. On June 15, 1961, Malco made an agreement with Mandex whereby the latter company was granted a non-exclusive license to manufacture and sell self-locking terminal devices covered by the agreements between Malco and Amphenol, which covered five pending patent applications including two applications which ultimately matured into the first and second patents in suit herein. In this agreement Mandex was to pay Malco a ten per cent royalty on all net sales of self-locking terminal devices. The agreement provided that any improvements made in such devices by Mandex must be assigned by it to Malco. The non-exclusive license granted to Mandex is non-assignable except to a corporation which acquires Mandex's entire business relating to electrical devices, provided, however, that Alex Just, or other specified persons, have the controlling interest in

the succeeding company, and that the succeeding company agrees to be bound by the Mandex non-exclusive contract.

7. The agreement Malco made with Mandex provided that it would terminate if Alex Just and the other persons specified by him ceased to own fifty per cent of the voting stock of Mandex, or in the event of bankruptcy of Mandex, or 120 days after Malco gives written notice to Mandex that the former elects to terminate the agreement, but unless sooner terminated under one of the provisions noted, the non-exclusive license will continue for the life of the last to expire patents. Obviously, however, there has been no attempt to collect royalties from Mandex beyond the date of expiration of any of the patents covered by the agreement.

8. In that Malco and Amphenol are joint owners of the patents covered by the agreement referred to herein and their agreement to the effect that no assignments under the patents would be made by either party without the written consent of the other, it is not an illegal agreement. Under the evidence herein, these joint owners of the patents in suit only safeguarded their rights therein to the same extent as an individual owner thereof. Their agreement in this regard does not violate the patent laws, and there is no evidence that any illegal monopoly has been created, or that any antitrust laws of the United States have been violated, and defendant has failed to establish that any contracts or business understanding or manufacturing arrangements between Malco and Amphenol, or between Malco and Mandex, constitute any patent misuse, or that they violate the antitrust laws, or that the defendant has been damaged in any way by reason of any alleged illegal conduct created by the agreements referred to.

Upon the foregoing Findings of Fact, the Court makes the following

CONCLUSIONS OF LAW

1. The Court has jurisdiction of the parties and of the subject matter of the issues as raised by the pleadings.

2. U. S. Letters Patent 2,995,617 entitled "Self-locking Terminal Connectors" as to each of the Claims 1, 2, 3, 5, 6, 7 and 9 is in all respects valid.

3. The defendant, under Section 271, 35 U.S.C., by using and selling terminal connectors and terminal assemblies thereof in its Types A and B series, has infringed the claims herein under Patent 2,995,617, but the defendant by using and selling terminal connectors and terminal assemblies in its Type C series has not infringed said patent 2,995,617.

4. Claims 1, 2, 3 and 4 of U. S. Letters Patent 3,086,074 are invalid and defendant has not infringed any valid claim of said patent.

5. Claims 1 and 2 of U. S. Letters Patent 3,136,591 are invalid, but they are not invalid by reason of any alleged sale more than one year prior to the filing date of the patent application for said patent.

6. The Malco-Mandex license was entered into on a voluntary basis and is an agreement between companies closely associated by reason of the persons controlling both companies, and this agreement does not constitute any patent misuse or violate any of the antitrust laws of the United States.

7. The agreement between the joint owners, Malco and Amphenol, is not an illegal extension of a patent monopoly.

8. The patent improvement grant-back clause in the Malco-Mandex agreement and the Malco-Amphenol option agreement, on this showing, are not illegal.

9. Defendant has not shown that it is a person injured in its business, property, or otherwise by reason of any alleged illegal conduct growing out of the agreements referred to which plaintiff entered into with Amphenol and which it entered into with Mandex.

10. Plaintiffs are entitled to an injunction against the defendant and all those in privity with it enjoining further infringement of Patent 2,995,617, as stated herein, with respect to the Types A and B series of the defendant, and an accounting to ascertain the amount of damages sustained by the plaintiffs as the result of said infringement, and judgment for the damages so ascertained.

11. The determination of costs and attorneys' fees to be allowed herein will be deferred until the further order of the Court.

12. Every Finding of Fact herein which may be deemed a Conclusion of Law is hereby adopted as a Conclusion of Law.

Judgment shall be entered accordingly. Exceptions are allowed.

Dated this 13th day of September, 1966.

BY THE COURT:

GUNNAR H. NORDBYE

Judge

MEMORANDUM

In that the above Findings of Fact recite in some detail the Court's views as to many of the issues which have arisen in this lengthy and involved patent litigation, this memorandum will be curtailed in length, but some observations should be made which will set forth in some additional detail the Court's views.

First Patent

It seems clear that the first patent in suit amply fulfills the requirement as to novelty, utility and nonobviousness. The immediate acceptance by the electrical and electronics industry of the self-locking terminal connector is highly significant. Its resistance to the forces of wire wrapping and its ability to withstand displacement forces encountered by the industry in ordinary use was immediately recognized by the Government and private concerns. The temptation to use one's hindsight as to obviousness should not be applied to the first patent in view of Oxley, 2,911,460. There, the use of a round shank with the so-called barbs had a central portion substantially the same uniformity in diameter as the aperture which extended through the terminal sleeve. The concept of the Oxley patent did not utilize or suggest an interference fit between the central portion of the shank and the passage of the terminal sleeve. This is particularly evident from the physical exhibits and charts in evidence. Moreover, it may be noted that there is no showing that the Oxley device had any commercial acceptance whatsoever. The other prior art such as Clark, 2,774,812, British, 641,917, and Carlson, 2,919,300, or a combination thereof with Oxley, did not teach or suggest to one of ordinary skill the embodiments of the novelty and utility of the first patent.

Due consideration has been given to *Graham* v. *John Deere Co.*, 383 U.S. 1, and *United States* v. *Adams*, 383 U.S. 39, and the recent decisions of the Eighth Circuit which have commented upon them. At times the presumption of validity which accompanies the issuance of a patent seems to be but a tenuous support for an inventor when he is faced with an attack on his patent in the courts, but here as to the self-locking terminal connectors, there can be no question as to novelty and utility. That, in part at least, has been amply sustained by the phenomenal acceptance of plaintiff's invention by private industry and the Government's Polaris program.

The difficulty which confronted the Court primarily with reference to the first patent pertained to the interpretation of the phrase "minimum transverse dimension" of the gripping shank. The Court indicated in its findings the apparent reason for confusion arising in the attempt to reconcile the specifications with the claims of the patent. But, as stated heretofore, where no invention is claimed in the locking notches depicted in some of the drawings by reason of the express direction of the Patent Office, and where it is the gripping shank without the locking notches which is the novelty claimed, and which features were purposely copied by the defendant, it would seem that plaintiffs have amply sustained their claim of infringement, The phrase "the minimum transverse dimension" in the claims of the patent does not enter into the patentees' claims of novelty whether that term refers to the thickness of the pin or the minimum width of the pin in the gripping shank.

In finding that the female contact of Type C of defendant's series does not infringe, it should be stated that the evidence is clear that it is the sleeve that is compressed

in Type C—not expanded as taught by plaintiffs' first patent. Thus, the novelty in the Type C series functions in a manner which is opposite to that taught by Patent No. 1. In other words, plaintiff's first patent utilizes a substantial interference fit between the gripping shank of the pin and the aperture of the insulator. The teaching is that thereby the insulator or sleeve is expanded to grip the aperture in the board. Defendant, however, in its Type C series locks the insulator in the board and thereby the terminal pin in the sleeve. Under the circumstances herein, an opposite method of producing a self-locking terminal cannot be said to invoke the doctrine of equivalency. In addition, reference should be made to the locking step on the Type C female connector which locks the insulator in the metal board and the pin in the sleeve—a feature not disclosed in plaintiffs' first patent.

Second Patent

As noted in the Findings, this patent was first held invalid by the Patent Office in view of Powell, with reference to which the Patent Examiner stated, p. 57 of the file history,

> "* * * Powell teaches the concept of providing terminal sleeves with polygonal portions 29 to aid in precise orientation of the parts, * * * ."

And later, on the same page,

> "To provide the insulating sleeves of the publication [New Chemelec Connectors—United States Gasket Company advertisement, Electronic Design, Jan. 1, 1956, page 81] with polygonal portions to assure proper seating and positioning would be obvious in view of Powell."

And later, on page 58,

> "Applicants argue that the Powell teaching of square insulators cannot be applied to the connectors in the publication since the Powell insulators are not aligned by an interference relationship therebetween. It is not exactly understood what applicants mean by 'interference relationship' but at any rate, Powell teaches how to properly align insulators and it is obvious that it is desirable to have the connector insulators shown in the publication properly aligned. Accordingly, to apply the alignment concept of Powell to the publication insulators would not be inventive."

In the file history, it was pointed out by the applicants for the second patent that in Powell when only a few connectors are concerned, the dominant variations may be of little consequence, but where thousands of terminal sleeves are concerned, the tolerance variations make it imperative that the heads of adjacent insulating sleeves be separated an "amount at least equal to the allowable dimensional tolerance of the heads." (p. 63).

Necessity of the separation of the heads in modern plates where a multitude of insulators were involved was evident at the time this patent application was made. Mechanical skill dictated that. The Patent Examiner stoutly resisted the claims of patentability and it was only after a tortuous road involving redrafted claims and personal visits that the patent was eventually allowed. However, the Court concludes that the Patent Examiner's original views as to Powell are highly pertinent here in this litigation in view of Netherlands, 64,131 (not before the Patent Office.) The evidence here in this proceeding is wholly insufficient to sustain a finding of patentable novelty in the second patent, and if so it was obvious to one of ordinary skill in the art. In any event, the evidence is wanting to sustain a finding that the defendant directly or indirectly aligns the head portions on its terminal boards

to maintain a predetermined angular orientation, or that the terminal boards made by defendant are designed for that purpose so as to stamp it as a contributory infringer.

Third Patent

The alleged novelty of facilitating connection of a circuit board into a basic circuit by bending the pins at a 90 degree angle in light of the prior art did not constitute invention. This patent has not sustained the test of either novelty or nonobviousness.

Alleged Patent Misuse and Antitrust Violations

There is but little that the Court can add to its findings under this phase of the litigation. It may be emphasized again that the Malco-Mandex contracts were between two closely allied concerns and entered into voluntarily with apparent benefits to each of the parties. Whether Mandex or its successor will have any complaints in the future as to the contract provisions is not for this Court to determine. There is an utter absence of any showing as to any patent misuse or any violation of the Sherman Act pursuant to a conspiracy or otherwise which this defendant may utilize for any relief as to it in this litigation.

This memorandum is hereby made a part of the above Findings of Fact and Conclusions of Law.

Dated this 13th day of September, 1966.

GUNNAR H. NORDBYE
Judge

OPINION OF COURT OF APPEALS

UNITED STATES COURT OF APPEALS
FOR THE EIGHTH CIRCUIT

No. 18,705

National Connector Corporation,
Appellant,

v.

Malco Manufacturing Company, a Partnership, Amphenol Corporation, and Malco Manufacturing Company, Inc.,
Appellees.

No. 18,706

Malco Manufacturing Company, a Partnership, Amphenol Corporation, and Malco Manufacturing Company, Inc.,
Appellants,

v.

National Connector Corporation,
Appellee.

Appeals from the United States District Court for the District of Minnesota.

[April 11, 1968.]

Before VOGEL, Senior Circuit Judge; BLACKMUN and LAY, Circuit Judges.

LAY, Circuit Judge.

The defendant National Connector Corporation (hereinafter called National) is charged by the plaintiffs (although more than one, hereinafter called Malco) with infringement of two United States Letters Patent Nos. 2,995,617 and 3,086,074, relating to electrical connectors.[1] The district court held patent '617 valid as to certain claims and found that National had infringed this patent in its types A and B series connectors, but not with its type C connector. In No. 18,705, National appeals the judgment of validity of patent '617, as well as the finding of infringement. In No. 18,706, Malco has cross-appealed the rejection of its claim of infringement by National's type C and likewise complains of the court's finding that patent '074 was invalid and additionally, of the finding that it was not infringed by National. In the judgment below Malco was awarded an accounting to ascertain damages. This action was stayed pending this appeal.

We find it unnecessary to discuss the claim of patent misuse and the various claims of infringement. We affirm the trial court's finding of invalidity on the '074 patent, and reverse as to the '617 patent, finding as a matter of law both patents obvious under 35 U.S.C. § 103.

MAXIMOFF '617 PATENT.

This patent is basically described by its title as a "Self-Locking Terminal." It consists of a metal contact or pin, inserted in a base plate (metallic) through a hole, held by a sleeve, sometimes called a bushing. It is described as a "feed through" terminal, which allows the flow of electrical impulses into multiple connections. The function of a very simple terminal connector may be visualized with

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[1] Malco also charged infringement of its Letter Patent No. 3,136,591. The court denied validity. This finding is not appealed.

the ordinary light plug. The utility of multi-contact terminal connectors becomes readily apparent in the twentieth century world of electronics. A means is thus provided for thousands of individual electrical connections through the use of a unitary terminal. As plaintiffs urge, the multi-contact terminal connector is the "heart" of the modern day computer, telecommunications systems and similar advanced electronic technology. For illustration, plaintiffs' plate-type connectors have been adopted by the United States Navy for the Polaris Missile program.

Malco first developed its "self-locking terminal" in 1957. It urges that it made possible the later development of its large "plate-type" terminal connectors, now used in the Polaris program. Contemporaneously, in 1960, Gardner-Denver Company developed a machine for automatically wiring a large, plate-type panel of terminal connectors. Thereafter, commercial success and utility were found for the plate-type connectors. The fabrication of these plates is considered by Malco to be a "trade secret."

Prior to the development of Malco's plate, molded block terminal connectors enjoyed exclusive commercial utility by computer manufacturers. It is pointed out that these blocks present many deficiencies which make them inferior to Malco's plate-type connectors. Efficiency, utility, flexibility and economy summarize the detailed arguments of improvement. Malco contends the rapid commercial acceptance of the plate-type connector demonstrates the obvious superiority between the two. These facts are deemed relevant by Malco since they argue that the plate-type connectors were made possible by development of the '617 self-locking terminals. Malco's evidence relates that the specific advantages of the "self-locking" terminal are rigidity of retention, low insertion forces, inherent straightening, elimination of manufacturing tolerances upon final assembly, inherent axial resiliency, capacity for extreme

density of terminal contact pattern, flexibility for circuitry changes and versatility for prototype design of complex electronic systems.

It is urged that the novelty of the '617 terminal is in the "self-locking" concept. Malco claims that prior art employed locking barbs or other locking means of the contact pin within the plate. Malco urges that the "uniqueness" of the '617 patent is that it incorporates a flat or rectangular pin larger than the "aperture of the sleeve." When the pin is driven into the sleeve a "laterally opposed pressure locking force is imparted at laterally opposed positions." Thus the sleeve grips the two opposite sides of the plate aperture which rigidly holds the contact pin. This is referred to as an "opposed pressure interference fit."

In simplification, we quote from Malco's opening statement to the trial court, ". . . so what we are talking about here is driving a square peg in a round hole. . . ." And as counsel added, the essential difference is that the prior are ". . . shows round terminals in round sleeves in round holes."

The trial court found the '617 patent not anticipated by the prior art, and held the patent valid under § 103 relying upon (1) the immediate "phenomenal" commercial acceptance with the country, (2) the long-felt need and (3) the unexpected advantages and results flowing from its development. Cf. *United States* v. *Adams,* 383 U.S. 39 (1966).

The basic issue, assuming novelty and utility established, concerns "obviousness" under § 103. This necessitates inquiry into (1) the determination of the scope and content of the prior art, (2) the ascertainment of the difference between the prior art and the claims under '617, (3) "the background skill of the calling," and (4) the existence of so-called "subtests" or collateral indicia of "nonobvious-

ness." *Graham* v. *John Deere Co.*, 383 U.S. 1 (1966). However, "subtests" cannot become persuasive if prior art anticipates or otherwise makes obvious the attributes of the improvement involved.

Thus, in *Calmar, Inc.* v. *Cook Chemical Co.*, decided together with *Graham*, supra at 26, although the patented device fulfilled a long-felt need and found great commercial success, nevertheless, these factors did not tip the scales of patentability where the improved art was found to be a "nontechnical" difference. See also *Kell-Dot Industries, Inc.* v. *Graves*, 361 F.2d 25 (8 Cir. 1966).

The prior art in the present case included electrical connectors described as the British, No. 641,917, Carlson, No. 2,919,300 and Clark, No. 2,744,812 patents. All of these utilized round pins in round sleeves, providing hermetic seals. Malco distinguishes the British patent as having a "conventional circumferential press-fit." In the Clark and Carlson patents there is no gripping effect involved, since the pin is the same size as the aperture. It is further argued that none of these patents features the non-round pin of the '617 patent.

And, Malco urges that '617 involves a different technique. The claim is made that all of the many advantages of the self-locking terminal flow from the new concept of "*opposed pressure* interference fit." Malco contends this is necessarily distinguishable from the prior art and any of its obvious potentialities. It is contended that this is made possible by the novel use of a flat terminal pin, called a "non-round gripping shank" in a sleeve and aperture of smaller dimension. As Malco urges, this is the "*vital* additional element."

It is stated that although the prior art, to-wit, Oxley, No. 2,911,460, anticipates the flat terminal pin, it is easily

distinguishable since Oxley locks by barbs and does not rely upon any kind of press-fit. Oxley also alternatively employs a round pin. National attempts to demonstrate by the Oxley flat pin in combination with the British patent that the '617 invention is anticipated. Malco replies that this is "hindsight" application, that the advantages of the combination were unobvious, and in the words of their expert, "no one knew that it would work."

One of the difficulties in evaluating the '617 patent is that throughout the testimony there appear many claimed attributes of the self-locking terminal, which necessarily go beyond the basic patent involved. The facility of insertion force, torque resistance, straightening, rigidity retention, density, et al, relate as much to other *vital* factors outside of the specific claims of '617 itself. It is evident that the material within the plate and sleeves, the fabrication of them, the punching of the holes in the plate, the dimensions of the pin, the bushings and aperture involved are all significant and related to the claimed attributes. Malco's early claims demonstrate that the use of locking notches now excluded from the patent itself exaggerates many of these claimed advantages. The examiner excluded the locked notches from the original filings as being directly anticipated by the prior art. This was originally related by Malco to be an "important feature" of the patent.

Mr. Kukla, the former head of the Research and Development Department of Malco, testified: ". . . in the beginning of the program . . . the plastics [used] were just too soft . . ." to give stability to the pin. And he adds ". . . the amount of reduction of the nylon . . ." determines to a great extent the stability of the pin in the final assembly. The substitution of material is not patentable. See *Insulite Co.* v. *Reserve Supply Co.*, 60 F.2d 433, 437 (8 Cir. 1932).

Mr. Kukla adds that the kind of material, the thickness of the plate (affects torque), the punching with a precise pattern (tolerance and density) and the preferred moisture content in the fabrication of the plates are all critical and yet not disclosed within the '617 patent. Malco admits the development of the Gardner-Denver automatic wire wrap machine substantially facilitated mass production of its plate-type connectors. All of the above factors leading to commercial success render this subtest less significant in measuring nonobviousness of the patent involved. See *American Infra-Red Radiant Co.* v. *Lambert Industries, Inc.*, 360 F.2d 977, 989-90 (8 Cir. 1966).

Rectangular terminals are not novel in the electronic field. The evidence is undisputed that the primary reasons Malco tried the rectangular pin was directly related to the Gardner-Denver Company requirement for their earlier hand wire wrap equipment. As early as 1951 Gardner-Denver recommended terminals have at least two sharp corners. The Gardner-Denver automatic wire wrap machine was not developed until the fall of 1960, and its recommendations for flat terminals still persisted.

In essence, Malco's claim must rest upon the asserted claim of a combination of old elements, in a new way which produced multi-contact terminals in a more efficient and cheaper way. This was the standard for patentability upheld by the Fifth Circuit involving the Graham patent. *Jeoffroy Mfg., Inc.* v. *Graham*, 219 F.2d 511 (5 Cir. 1955), cert. den. 350 U.S. 826. This standard was later rejected in the *Graham* Supreme Court decision, 383 U.S. 1. Likewise rejected was this Circuit's view that such a combination must produce a new result. See 383 U.S. at 4, affirming on other grounds 333 F.2d 529. The problem is that such an argument likewise overlooks that obvious attributes of the prior art necessitate exploration as well as

the prior art itself. *Graham* v. *John Deere Co.*, supra; *Calmar, Inc.* v. *Cook Chemical Co.*, supra.

We can see nothing novel or unique in changing a round pin to a flat one. Nor do we see nonobvious attributes to the insertion of a rectangular pin and sleeve into a smaller aperture within the plate itself. Nor are we impressed with the nuance urged that pressure interference fit takes place within the board rather than without. Differences in configuration only are not patentable. *Gerner* v. *Moog Industries, Inc.*, 383 F.2d 56 (8 Cir. 1967).[2] As has been stated many times, changes of mere form, proportions or size will not sustain patentability. Malco's own witness stated that with the need to make a pin suitable for the wire wrap machine that it was "logical to go to square or rectangular shank." Cf. *The Greening Nursery Co.* v. *J & R Tool & Mfg. Co.*, 376 F.2d 738 (8 Cir. 1967) [obvious: changing square plate to round one with more efficient results]; *Superior Concrete Accessories, Inc.* v. *Richmond Screw Anchor Co., Inc.*, 369 F.2d 353 (8 Cir. 1966) [obvious: changing angle of bolt from 90° to 45° "in order to hold a form for a skirt or addition to the outer edge of the structure."] Malco fails to point out any prior difficulties or deterrents known with electrical connectors involving the combination of the "square peg in a round hole." Cf. *United States* v. *Adams*, supra.

Nor can we be impressed that the "opposed pressure" fit is so unique or nonobvious. Of course, different frictional pressures will react depending upon the configura-

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[2] Apropos is Thomas Jefferson's comment cited by Mr. Justice Clark: "[A] mere change of form should give no right to a patent, as a high-quartered shoe instead of a low one: a round hat instead of a three-square: or a square bucket instead of a round one." *Graham* v. *John Deere Co.*, 383 U.S. 1, 10 n. 3.

tion of the objects used. The concept of interference fitting belongs in the public domain.[3] It belongs to ordinary people with ordinary minds. The fact that it is accomplished with different shaped objects in multi-shaped receptacles can make little difference. See *Application of Chupa,* 359 F.2d 908 (U.S. Ct. Customs & Pat. App. 1966) [obvious: axial and radial compression inherent in the change of a configuration]; *Application of Hammell,* 332 F.2d 796 (U.S. Ct. of Customs & Pat. App. 1964) [obvious: "force-fit" frictional electrical connections.] Although it might be accomplished in different ways, the principle itself can be said to be older than the cork and the bottle.

The change in the form of any element of a prior patent must result in more than a useful natural phenomenon which man has accumulated through common knowledge. Thus, even though the use of a new device greatly improves the field and provides great utility, and commercial success is enjoyed because of the long-felt need, these features cannot sustain patentability where involved is only an extended application of obvious attributes from the prior art. Cf. *Frederick Stearns & Co.* v. *Grove's Laboratories, Inc.,* 87 F.2d 822, 824 (8 Cir. 1937).

In summary, it should be stated that nonpatentability does not turn upon the new device utilizing isolated elements of prior art and combining them. When the resulting new combination produces a totally new functional aspect, to deny patentability in every case would be to sanction the use of "hindsight" in light of the claimed

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[3] In describing this Malco's Mr. Kukla stated: "I believe a substantial interference fit is when an object is placed into a hole in a plastic sleeve and subsequently when the outside of the sleeve yields or expands, you have established a substantial fit."

patent. However, at the same time, to deny patentability where the combination of elements is an obvious step, where no inherent difficulties or deterrents are involved in making the step, where the new combination results in a natural phenomenon, even though all of the advantages were not foreseen, should not bring into play the introspective condemnation of using "hindsight." The test of obviousness, again, must turn upon a case by case analysis. See *L & A Products, Inc.* v. *Britt Tech Corp.*, 365 F.2d 83, 86 (8 Cir. 1966). This reduces Malco's claim to simply being first with a good idea. Of course, this alone is not a basis for patentability. *Id.* at 87.

This brings us to the second patent, No. 3,086,074. The trial court denied the validity of this patent in view of the prior art on the grounds of obviousness and lack of novelty. This patent involves "self-orientating terminal connectors." It relates to the proper alignment of the electrical terminal by using square or polygonal heads on the insulating sleeves. The desired goal is proper mating between a male and female connector. They plug together and allow little or no "angular misorientation" between perpendicularity of the male blade to the plane of the female connector.

The trial court found:

> "Although this prior art discloses polygonal heads which touch each other, it would be quite obvious to anyone with ordinary skill in the art, that in terminal boards utilizing hundreds and even thousands of connector sleeves, and in view of tolerance variations, a small space therefore between the polygonal heads would be advisable. . . .
>
> "The Court finds, therefore, as to the second patent that it discloses no novelty over the prior art other than the utilization of mechanical skill in the spacing

of a multitude of apertures in a terminal board requiring a compactness of bushings and terminal pins in a small area and the recognition of the necessity of some spacing between the polygonal bushings in view of the necessity of replacing damaged bushings. . . ."

Again, the form of the insulating sleeve is changed from a round one to a square or polygonal shaped head. Our discussion under the '617 patent is applicable here. Likewise, the concept of the spacing or clearance between the bushings cannot be accepted as novel or unobvious.[4]

We agree with the trial court that the improvement upon the prior art, the Netherlands, patent No. 64,131 and Powell, patent No. 2,930,020, involved only the mechanical skill of the art involved.

The judgment is reversed in No. 18,705 as to the '617 patent and it is remanded with directions to dismiss. Judgment is affirmed in No. 18,706 as to the '074 patent.

A true copy.

Attest:

Clerk, U. S. Court of Appeals, Eighth Circuit.

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[4] Cf. *Ske-trainer, Inc.* v. *Garelick Mfg. Co.*, 361 F.2d 895, 899 (8 Cir. 1966). Simplicity is not the same as obviousness. However, where there is only a "mechanical" advance it must be held to be obvious to one with ordinary skill and knowledge of prior art in this field.

Constitutional Provision Involved

Article I, Clause 8:

The Congress shall have the power . . . to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

Statutes Involved

Title 35:

§ 103. Conditions for patentability; non-obvious subject matter

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

§ 282. Presumption of validity; defenses

A patent shall be presumed valid. The burden of establishing invalidity of a patent shall rest on a party asserting it.

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